Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data;

A1 force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data; and

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data, wherein in response to said performance of the user during said exercise said virtual reality simulation means controls [determination] updating of said virtual image and said force feedback means, said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits.

2. (Original) The system of claim 1 wherein said exercise is a range of motion exercise.

3. (Original) The system of claim 1 wherein said exercise is a speed of motion exercise.

4. (Original) The system of claim 1 wherein said exercise is a fractionation exercise of said one or more digits.

5. (Original) The system of claim 1 wherein said exercise is a strength exercise.

Cont

6. (Original) The system of claim 1 wherein said exercise is executed with all fingers of said one or more digits and is executed separately with a thumb of said one or more digits.

Cl

7. (Original) The system of claim 1 wherein said sensing means is a sensor glove.

8. (Original) The system of claim 7 wherein said sensor glove provides one or more measurements selected form the group consisting of: metacarpophalangeal (MCP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, proximal interphalangeal (PIP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, finger abduction and wrist flexion.

performance is measured from:

$$\max\left(\frac{MCP + PIP}{2}\right) - \min\left(\frac{MCP + PIP}{2}\right).$$

9. (Currently Amended) [The system of claim 8 wherein]A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data, said sensing means is a sensor glove, said sensor glove provides one or more measurements selected form the group consisting of: metacarpophalangeal (MCP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, proximal interphalangeal (PIP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, finger abduction and wrist flexion;

force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data; and

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data,

wherein in response to said performance of the user during said exercise said virtual reality simulation means controls updating of said virtual image and said force feedback means,

said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits, said exercise is a range of motion exercise and said performance is measured from:

$$\max\left(\frac{MCP + PIP}{2}\right) - \min\left(\frac{MCP + PIP}{2}\right).$$

10. (Currently Amended) [The system of claim 8 wherein]A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data, said sensing means is a sensor glove, said sensor glove provides one or more measurements selected form the group consisting of: metacarpophalangeal (MCP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, proximal interphalangeal (PIP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, finger abduction and wrist flexion;

force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data; and

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data,

wherein in response to said performance of the user during said exercise said virtual reality simulation means controls updating of said virtual image and said force feedback means, said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits, said exercise is speed of motion exercise and said performance is measured from:

$$\max\left(\frac{speed(MCP) + speed(PIP)}{2}\right).$$

wherein speed(MCP) is a mean of an angular velocity of said MCP joint angle and speed(PIP) is a mean of an angular velocity of said PIP joint angle.

Cont

Cl

11. (Currently Amended) [The system of claim 8 wherein]A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data, said sensing means is a sensor glove, said sensor glove provides one or more measurements selected form the group consisting of: metacarpophalangeal (MCP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, proximal interphalangeal (PIP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, finger abduction and wrist flexion;

force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data; and

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data,

wherein in response to said performance of the user during said exercise said virtual reality simulation means controls updating of said virtual image and said force feedback means, said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits, said exercise is a fractionation exercise of said one or more digits and said performance is measured from:

$$100\% \left(1 - \frac{\Sigma \text{PassiveFingerRange}}{3\ \text{ActiveFingerRange}}\right)$$

where ActiveFingerRange is the current average joint range of the finger being moved and PassiveFingerRange is the current average joint range of the other three fingers combined.

12. (Currently Amended) [The system 8 wherein]A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data, said sensing means is a sensor glove, said sensor glove provides one or

Cont
C1

more measurements selected form the group consisting of: metacarpophalangeal (MCP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, proximal interphalangeal (PIP) joint angle of a thumb of said one or more digits and a finger of said one or more digits, finger abduction and wrist flexion;

force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data; and

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data,

wherein in response to said performance of the user during said exercise said virtual reality simulation means controls updating of said virtual image and said force feedback means, said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits, said exercise is strength exercise and said performance is measured from:

$$\max\left(\frac{MCP + PIP}{2}\right) - \min\left(\frac{MCP + PIP}{2}\right).$$

13. (Currently Amended) [The system of claim 1 further comprising:] A system for rehabilitation of a neuromotor disorders of a user comprising:

sensing means adapted for sensing position of one or more digits of a hand of said user to provide first sensor data;

force feedback means adapted for applying force feedback to said one or more digits and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data;

virtual reality simulation means for determining a virtual image of virtual objects movable by said user to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and determining performance of said user from said first sensor data and said second sensor data; and

Cont C1

means for establishing one or more targets from said performance of said user and means for displaying said one or more targets to said user,

wherein in response to said performance of the user during said exercise said virtual reality simulation means controls updating of said virtual image and said force feedback means, said force feedback means being controlled to move said one or more digits to a position represented by said virtual image or to apply said force feedback to said one or more digits.

14. (Original) The system of claim 13 wherein said targets are displayed in real time as numerical values.

15. (Original) The system of claim 13 wherein said targets are displayed graphically as horizontal bars changing color to indicate achievement of said target.

16. (Original) The system of claim 1 wherein said exercise is a range of motion exercise and said virtual object is a window wiper moving over a fogged window wherein as said window wiper is moved over a virtual position of said fogged window a picture is revealed at said virtual position.

17. (Original) The system of claim 1 wherein said exercise is a speed of movement exercise and said virtual object is a traffic light and a virtual hand catching a first virtual ball, wherein on a change of a signal of said traffic light said user closes said one or more digits for interacting with said virtual image to catch said first virtual ball.

18. (Original) The system of claim 1 wherein said exercise is a speed of movement exercise and said virtual object is a virtual hand and virtual butterfly, wherein said user moves said one or more digits for interacting at a predetermined speed with said virtual image to make said virtual butterfly fly away from said virtual hand.

19. (Original) The system of claim 18 further comprising a virtual opponent including a second virtual hand catching a second virtual ball, wherein if said user catches said first virtual ball before said opponent catches said second virtual ball said first virtual ball remains on said virtual hand or if said user catches said first virtual ball after said virtual opponent catches said second virtual ball said first virtual ball falls from said virtual hand.

Cont
C1

20. (Original) The system of claim 1 wherein said exercise is a fractionation exercise and said virtual object is a piano keyboard with one or more keys, wherein one as said one or more digits is moved a corresponding said key turns a different color.

21. (Original) The system of claim 1 wherein said exercise is a strength exercise and said virtual object is virtual force feedback glove, wherein said force feedback means comprises a force feedback glove having an actuator associated with said one or more digits and as said respective actuators are depressed by said one or more digits of said user a corresponding virtual actuator on said virtual force feedback glove is filled with a color.

22. (Original) The system of claim 21 wherein said color changes depending on achievement of a percentage of a target of said performance.

23. (Original) The system of claim 1 wherein said force feedback means is a force feedback glove.

24. (Original) The system of claim 23 wherein said force feedback glove comprises one or more actuators each coupled to a respective said one or more digits.

25. (Original) The system of claim 24 wherein said force feedback glove further comprises one or more sensors each coupled to a respective said one or more actuators.

26. (Original) The system of claim 1 wherein said neuromotor disorder is a stroke.

27. (Original) The system of claim 1 further comprising storing means for storage of one or more of said virtual image, said first sensor data, said second sensor data and said performance.

28. (Original) The system of claim 27 wherein said storing means is a database.

29. (Original) A method for rehabilitation of a neuromotor disorder of a user comprising:

determining a virtual image of a virtual object movable by said user to virtually simulate an exercise adapted to be performed by said user;

sensing position of one or more digits of a hand of said user as said user interacts with said virtual image to provide first sensor data;

Cont Cl

applying force feedback to said one or more digits of said hand in response to said virtual image and measuring position of a tip of each of said one or more digits in relation to a palm of said hand after said force feedback is applied to provide second sensor data;

determining performance of said user from said first sensor data and said second sensor data; and

updating said virtual image in response to said performance of the user during said exercise.

30. (Original) The method of claim 29 wherein said exercise is a range of motion exercise.

31. (Original) The method of claim 29 wherein said exercise is a speed of motion exercise.

32. (Original) The method of claim 29 wherein said exercise is a fractionation exercise of said one or more digits.

33. (Original) The method of claim 29 wherein said exercise is a strength exercise.

34. (Original) The method of claim 29 wherein said exercise is executed with all fingers of said one or more digits and executed separately with a thumb of said one or more digits.

35. (Original) The method of claim 29 wherein said sensing step comprises wearing a sensor glove.

36. Currently Amended) [The method claim 29 further comprising the steps of:]

A method for rehabilitation of a neuromotor disorder of a user comprising:

determining a virtual image of a virtual object movable by said user to virtually simulate an exercise adapted to be performed by said user;

sensing position of one or more digits of a hand of said user as said user interacts with said virtual image to provide first sensor data;

applying force feedback to said one or more digits of said hand in response to said virtual image and measuring position of a tip of each of said one or more digits in relation to a palm of said hand after said force feedback is applied to provide second sensor data;

determining performance of said user from said first sensor data and said second

cont
C1

sensor data;

updating said virtual image in response to said performance of the user during said exercise;

establishing one or more targets from said performance of said user; and

displaying said one or more targets to said user,

wherein said virtual image is updated based on said one or more targets.

37. (Original) The method of claim 29 wherein said exercise is a range of motion exercise and said virtual object is a window wiper moving over a fogged window wherein as said window wiper is moved over a virtual position of said fogged window a picture is revealed at said virtual position.

38. (Original) The method of claim 29 wherein said exercise is a speed of movement exercise and said virtual object is a traffic light and a virtual hand catching a first virtual ball, wherein on a change of a signal of said traffic light said user closes said one or more digits for catching said first virtual ball.

39. (Original) The method of claim 29 further comprising a virtual opponent including a second hand catching a second virtual ball, wherein if said user catches said first virtual ball before said opponent catches said second virtual ball said first virtual ball remains on said hand or if said user catches said first virtual ball after said virtual opponent catches said second virtual ball said first virtual ball falls from said virtual hand.

40. (Original) The method of claim 29 wherein said exercise is a fractionation exercise and said virtual object is a piano keyboard with one or more keys, wherein one as said one or more digits is moved a corresponding said key turns a different color.

41. (Original) The method of claim 29 wherein said exercise is a strength exercise and said virtual object is a virtual force feedback glove.

42. (Original) The method of claim 29 wherein said force feedback step comprises wearing a force feedback glove on said hand.

43. (Original) The method of claim 42 wherein said force feedback glove comprises one or more actuators each coupled to a respective said one or more digits.

Cont A1

44. (Original) The method of claim 43 wherein said force feedback glove further comprises one or more sensors each coupled to a respective said one or more actuators.

45. (Original) A method for rehabilitation of a stroke patient comprising:

determining a plurality virtual images each virtual image simulating an exercise adapted to be performed by said patient;

sensing position of one or more digits of a hand during interaction of said patient with each said virtual image to provide first sensor data;

optionally applying force feedback to said one or more digits of said hand of said patient in response to one of said virtual images and measuring position of a tip of each of said one or more digits in relation to a palm of said hand if said force feedback is applied to provide second sensor data;

determining performance of said user from said first sensor data or said second sensor data; and

updating said plurality of virtual images in response to said performance of the user during said respective exercises.

46. (Original) A method for rehabilitation of a stroke patient comprising:

determining a plurality virtual images each virtual image simulating an exercise selected from the group consisting of a range of motion exercise, a range of speed exercise, fractionation exercise and a strength exercise;

sensing position of one or more digits of a hand during interaction of said patient with each respective said virtual image simulating said range of motion exercise, said range of speed exercise, and said fractionation exercise to provide first sensor data;

applying force feedback to said one or more digits of said hand of said patient in response to said virtual image simulating said strength exercise and measuring position of a tip of each of said one or more digits in relation to a palm of said hand after said force feedback is applied to provide second sensor data;

determining performance of said patient from said first sensor data or said second sensor data; and

Cont C1

updating said plurality of virtual images in response to said performance of said patient during said respective exercises.

47. (Original) The method of claim 46 wherein said interaction of said patient with each respective said virtual image is repeated a predetermined number of times for each exercise.

48. (Original) The method of clam 46 wherein said force feedback is repetitively applied to said patient a predetermined number of times.

49. (Original) A system for rehabilitation of a stroke patient comprising:

means for determining a plurality virtual images each virtual image simulating an exercise selected from the group consisting of a range of motion exercise, a range of speed exercise, fractionation exercise and a strength exercise;

means for sensing position of one or more digits of a hand during interaction of said patient with each respective said virtual image simulating said range of motion exercise, said range of speed exercise, and said fractionation exercise to provide first sensor data;

means for applying force feedback to said one or more digits of said hand of said patient in response to said virtual image simulating said strength exercise;

means for measuring position of a tip of each of said one or more digits in relation to a palm of said hand of said patient after said force feedback is applied to provide second sensor data;

means for determining performance of said patient from said first sensor data and said second sensor data; and

means for updating said plurality of virtual images in response to said performance of the user during said respective exercises.

50. (Currently Amended) A distributed system for rehabilitation of a stroke patient comprising:

a rehabilitation site comprising sensing means adapted for sensing position of one or more digits of a hand of said patient to provide first sensor data, force feedback means adapted for applying force feedback to said one or more digits of hand and for measuring position of a tip of each of said one or more digits in relation to a palm of said hand to provide second sensor data, and virtual reality simulation means for determining at least one virtual

Cont C1

image of one or more virtual objects movable by said patient to virtually simulate an exercise adapted to be performed by said user, said virtual reality simulation means receiving said first sensor data and said second sensor data and [determining] updating performance data of said patient from said first sensor data and said second sensor data, said virtual reality simulation means controlling determination of said at least one virtual image and controlling said force feedback means in response to said performance of the patient during said exercise;

a data storage site for storing said virtual images and said performance data; and

a data access site for remotely reviewing said virtual images and performance data.

51. (Original) The distributed system of claim 50 wherein said rehabilitation site, said data storage site and said data access site are connected to each other through an Internet connection.